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A CORRELATION STUDY BETWEEN THE SHIPLEY-HARTFORD  
TEST OF MENTAL MATURITY AND THE MINNESOTA  
MULTIPHASIC PERSONALITY INVENTORY

by

Richard Roy Speechly

A thesis submitted in partial fulfillment  
of the requirements for the degree

of

MASTER OF SCIENCE

in

Psychology

Approved:

UTAH STATE UNIVERSITY  
Logan, Utah

1973

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Richard Roy Speechly

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## ABSTRACT

A Correlation Study between the Shipley-Hartford

Test of Mental Maturity and the Minnesota

Multiphasic Personality Inventory

by

Richard Roy Speechly, Master of Science

Major Professor: Reed Morrill

Department: Psychology

The Minnesota Multiphasic Personality Inventory (MMPI) has been recognized as a helpful tool to the psychologist in identifying abnormal characteristics (Leverenz, 1956; Modlin, 1956; Hathaway and Mckinley, 1967; Hock, 1970). Likewise the Shipley-Institute of Living Scale for Measuring Intellectual Impairment (S-H) has also been recognized as a helpful tool in identifying emotional impairment (Pollack, 1942; Halstead, 1943; Fleming, 1943; Wright, 1946; Garfield and Fey, 1948; Lewinsohn, 1963). Despite the research which suggests both tests are capable of helpful diagnosis in the general area of psychological impairment (Welch, 1956; Lewinsohn, 1963), little if any work has been done examining the compatibility of the two instruments. Therefore, a correlation study was made between the two tests.

Sixty-one male in-patients of the Wyoming State Hospital, between the ages of 18-45 (Garfield and Fey, 1948) and having a verbal IQ of 14.3 years (Shipley and Burlingame, 1941), were administered both the S-H and the MMPI.

The conceptual quotient (CQ), "a measure of intellectual impairment based upon the assumption that where there is intellectual impairment, vocabulary is less affected than is the capacity for abstract thinking and that in such cases there will be a discrepancy between vocabulary level and the ability to handle abstract problems" (Lewinsohn, 1963, p. 444) of the S-H, was correlated with the number of Peterson's Psychotic Profile Signs (Peterson, 1954) a patient might acquire after taking the MMPI. Peterson's model was chosen as the criteria for discriminating MMPI profiles because of its relative ease of use and successful experimental value (Peterson, 1954). Secondly, the CQ score was correlated with each individual subtest "T" score of the MMPI. Analysis of the experimental data was achieved statistically by use of Pearson's product-moment correlation.

The results of the study showed no significant correlation between S-H's CQ and Peterson's signs. Further, no significant correlation was found with eight of the ten subtest scores on the MMPI and Shipley's CQ. However, there was a low but significant correlation between Shipley's CQ and the Hy and Mf subscales of the MMPI. No determining factor was found to explain the common variance in these two correlations.

## INTRODUCTION

The Minnesota Multiphasic Personality Inventory (MMPI) has proved to be a helpful tool to the psychologist in identifying abnormal characteristics (Leverenz, 1956; Modlin, 1956; Hathaway and McKinley, 1967; Hock, 1970). Because of its very nature, however, i.e., its administrative length, scoring complexity and varied interpretive methods, the test can take up a great deal of the psychologist's time. It would be advantageous then, to secure a short group test which could be a meaningful indicator of the general theme generated by the MMPI. Such an instrument could be an asset to a mental hospital which uses the MMPI as a standard admittance test.

The Shipley-Institute of Living Scale for Measuring Intellectual Impairment, formerly the Shipley-Hartford Retreat Scale for Measuring Intellectual Impairment and referred to hereafter as the (S-H) has been suggested as a possible indicator of the constructs used in the MMPI.

Little, if any, research has been done comparing S-H scores to MMPI scores. Nevertheless, research establishing each test as an indicator of psychological maladjustment has been done (Welch, 1956; Lewinsohn, 1963). Peter M. Lewinsohn (1963) indicates that the conceptual quotient (CQ) of the S-H is a significant indicator of chronic and acute schizophrenia. He defines this psychological construct of the S-H as

the measure of intellectual impairment based on the assumption that where there is intellectual impairment,

vocabulary is less affected than is the capacity for abstract thinking and that in such cases there will be a discrepancy between vocabulary level and the ability to handle abstract problems. (Lewinson, p.

That is to say, tests of vocabulary tend to remain stable under psychological impairment while the ability to think abstractly becomes an increasingly difficult task as deterioration increases (Shipley and Burlingame, 1941; Goldstein, 1941). Shipley and Lewinsohn suggest then, that the difference between these two notions is a measure of intellectual impairment. Lewinsohn's study concludes that patients with schizophrenic symptoms can be identified by the use of the S-H scale.

H. Halstead (1943) in a study comparing the progress Matrix Test to the S-H, found that significantly lower scores were made by 700 neurotics, than by a control group. His study further indicated that the S-H was measuring maladjustment, not merely mental age.

Again, the Shipley scale was administered to 20 subjects suffering from melancholia. Fleming (1943) states that "there appears to be a lowering of the CQ in melancholia (depression) to a level which is regarded as pathological." The scale confirmed clinically diagnosed intellectual impairment.

In another study, Pollack (1942) concluded that the S-H was a valid indicator of patients suffering from functional psychoses. In his research he administered the S-H scale to 50 unimproved, chronic patients in a state hospital. Twenty-three of the cases were schizophrenics while the remainder were assorted types of organic and functional psychoses. The results

revealed that most of the schizophrenics showed signs of deterioration, which agreed with clinical diagnoses. Further, those suffering from organic psychoses received the very lowest scores while functional psychotics tended to score just above them.

Research suggests that the S-H can be an effective tool in identifying the intellectual impairment of functional and organic psychosis and in most cases identifying poor conceptual thinking. Likewise, the MMPI suggests a persistent ability to identify psychotic symptoms (Horn and Stewart, 1968).

The question under consideration here is whether the conceptual quotient of the S-H is an adequate indicator of functional psychoses as compared to test scores on the MMPI. Despite the independent research of both instruments concerning their diagnostic ability, there is no evidence to indicate that one could be an adequate indicator of the other. The problem of this study is, then, that there is a lack of research to indicate whether the S-H test can be a significant indicator of intellectual impairment as compared to MMPI test scores.

## REVIEW OF LITERATURE

Early in the investigation of mental functioning and its impact on psychopathology, Goldstein (1941) identified two modes of behavior, the abstract and the concrete. The normal person was said to be able to perform both, while the abnormal person was limited to but one of the behaviors, the concrete. He assumed that the two types of behaviors were merely manifestations of, or rather, capacity levels of the total personality. He defined these levels as attitudes. He said, "Our concept of attitude implies a capacity level of the total personality in a specific plane of activity." (Goldstein, 1941) This plane included both the internal as well as the external world of a person. Goldstein saw the concrete attitude as a realistic, "immediate apprehension of a given thing or situation in its particular uniqueness." In other words, behaviors resulting from concrete perceptions would be characterized by rigidity, lack of shifting, and inability to generalize and inability to recognize new sets. Therefore, it would be difficult, if not impossible, for a person displaying abnormal concrete thinking to realize other potential functions for an object.

On the other hand, the abstract attitude encompassed more than the mere reality of a stimulus, but included all the possible sets and categories it could be a part of. Goldstein listed eight modes of behavior responsible to abstract attitudes. They are:



1. To detach our ego from the outer world or from inner experiences.
2. To assume a mental set.
3. To account for acts to oneself; to verbalize the account.
4. To shift reflectively from one aspect of the situation to another.
5. To hold in mind simultaneously various aspects.
6. To grasp the essential of a given whole; to break up a given whole into parts, to isolate and to synthesize them.
7. To abstract common properties reflectively; to form hierarchic concepts.
8. To plan ahead ideationally; to assume an attitude towards the "mere possible" and to think or perform symbolically. Note: concrete behavior does not have these characteristics.

Goldstein is emphatic to point out that there are various degrees of both concrete and abstract behavior. For instance, the highest form of abstraction would be the forming of generalized and hierarchic concepts while a lower form would be the planning or initiating of insightful behavior without a distinct awareness of its further course. The most concrete way of dealing with something is to react to only one aspect of it, while a less concrete behavior would be responding to more than just one characteristic of the stimulus.

In an address made to the American Psychiatric Association, Goldstein (Kasanin, 1944) suggested that the same results be found characteristic of brain damaged patients, that is, impairment of abstract behavior, was also characteristic of schizophrenics. An early pioneer in the area, Vigotsky



(1934), also believed that the change he found in schizophrenics was similar to the impairment of the attitude toward the abstract that Goldstein found in organics. Further, Cameron (1939) came to the conclusion that "the schizophrenic's tendency to maintain the concrete attitude" is strong. Goldstein and Bolles (1938) also confirmed that through research a great deal of concreteness was characteristic in the behavior of the schizophrenic. Kasanin (1944) has supported these previous findings. He states, ". . . the schizophrenic thinks largely in more concrete, realistic, matter-of-fact terms, in which things have a personal rather than a symbolic value." (Kasanin, p. 1944) For example, a schizophrenic would tend to put the most heterogeneous blocks together stating that they belonged together because they were all policemen or all little people. Interestingly enough, all the blocks would appear very dissimilar to the normal individual. Thus, schizophrenics tend to classify things purely on the physical aspects of a stimulus.

Another important characteristic of the schizophrenic is the endless hesitancy and vacillation between various aspects of the stimulus. This is due to his inability to abstract one principle of a given item while he neglects the others. It should also be noted that all schizophrenics don't respond the same. Benjamin (Kasanin, 1944) found that the most marked disturbances in conceptual thinking took place in hebephrenics, paranoid schizophrenics, and chronic insidious schizophrenics. He found the least disturbance in paranoids and acute catatonics.

Therefore, from the research mentioned, it may be safe to state that a primary identifiable characteristic of most schizophrenics would be the inability to think abstractly. Building from this premise, Shipley and Hartford devised a test of intelligence whereby vocabulary and abstraction items could be used to arrive at an intelligence quotient and a conceptual quotient. The ideology behind the test was to provide a quick estimate of a patient's intellectual and conceptual abilities.

Wright (1946) using the Shipley-Hartford test (S-H) in evaluating intellectual functioning of neuro-psychiatric patients, acquired favorable results with the instrument. The purpose of the research was to survey the intellectual abilities of hospital personnel with neuropsychiatric involvements and further, to determine the validity of the S-H as a basis for estimating intellectual level. The population was 977 male neurotic patients with a mean age of 27 years. Scores from the S-H were analyzed in three ways. First, for original intelligence measured by vocabulary ability; second, functional intelligence measured by correlating the S-H with the Wechsler-Bellevue; third, intellectual efficiency measured by the conceptual quotient (CQ) of the S-H. The results showed that the S-H could be used to approximate the general intelligence of an individual. Further, they indicated that a substantial proportion (62%) of the neuropsychiatric group had CQ's suggesting intellectual impairment; i.e., 10% were slightly suspicious, 14% moderately suspicious, 26% very suspicious and 12% probably pathological. This was consistent with prior clinical observations.

Pollack (1942) suggests that the S-H can be a valid indicator of emotional deterioration. In a study specifically designed to measure deterioration, he administered the S-H scale to 50 unimproved, chronic patients in a state hospital. Twenty-three of the cases were schizophrenics. The remainder were assorted types of organic and functional psychotics. The results of the study indicated that most of the schizophrenics showed signs of deterioration. These results agreed to prior clinical diagnosis. Further, those suffering from organic psychoses were also diagnosed accurately. Though Pollack concluded that the test was valid, he recognized several limitations. He stated that the S-H was not effective at lower vocabulary and mental age levels and that it required a high degree of patient cooperation.

Halstead (1943) tends to confirm the results of Pollack. In an analysis of the Matrix (Progressive Matrices) test results of 700 neurotic military subjects compared to the S-H, Halstead found that significant identifiable scores were made by the neurotics.

The success of Lewinsohn (1963) further lends support to the assumption that the S-H is an indicator of impairment. In a study dealing directly with the conceptual quotient (CQ) of the S-H, Lewinsohn hypothesized that the CQ's of chronic and acute schizophrenics did not differ from the CQ's of an appropriate control group, also that the discrepancy between the performance on the abstraction and vocabulary subtests of the S-H was unrelated to conceptual disorganization. Lewinsohn (1963) defines CQ as "the measure of intellectual impairment based upon the assumption that where there is

intellectual impairment, vocabulary is less affected than is the capacity for abstract thinking and that in such cases there will be a discrepancy between vocabulary level and the ability to handle abstract problems." He took this assumption from Shipley's (1941) work, which demonstrated that CQ differences between a normal standardized group and various psychiatric patients, showed various degrees of intellectual impairment. The results of Shipley's study indicated that organics, followed by functional psychotics, receive the lowest CQ's. However, Shipley did not control for age and decreasing vocabulary level of the subjects which Fecher, Garfield, Fey, Lewinsohn, and Nichols suggest are determining factors in a declining CQ (Lewinsohn, 1963). Therefore, Lewinsohn evaluated the use of the S-H CQ as a measure of intellectual impairment. He administered the test to four groups of 30 subjects matched for age and vocabulary. Chronic and acute schizophrenic, non-schizophrenic patients and normal subjects were used. The results showed that the CQ for chronic and acute schizophrenics was lower than those of normal subjects at the .01 and .05 level. Further, the residual abstraction score, i. e., the difference between the estimated and obtained S-H abstraction subtest scores, was significant at the .01 level. Thus, the results did not support either of the two hypothesis. Lewinsohn concluded that "the results can be interpreted as providing some support for the assumptions underlying the use of the discrepancy between vocabulary and abstraction level, thus the S-H can be thought of as an index of intellectual impairment." (Lewinsohn, 1963)

In an earlier study, Fleming (1943) used the S-H as a measure of intellectual impairment with 20 cases of depression. He concluded that there appeared to be a significant lowering of the CQ in this disorder to a level which he regarded as pathological.

In another early study carried out in 1955 by Barteleme and Riley (Barteleme, 1955), the S-H and MMPI were jointly used as determining factors for predicting the successful achievement or nonachievement of a six-month training program by psychiatric technician trainees. The relevance of this study is mentioned because both the S-H and the MMPI were used as mental measurements in the experiment. The trainees were studied on a number of intellectual and personality variables. It was expected that a systematic variation would occur along known criterion; i. e., completion of the training program. Eighty subjects were placed in the success group, 53 in the failure group. The results indicated that there were no significant differences or separations on the intellectual variables. However, analysis of personality variables indicated that unsuccessful trainees differed from successful trainees in terms of such factors as social rigidity, irresponsibility, impulsivity and anxiety. However, the study failed to show any correlation between the two tests. One important conclusion if any to be drawn from Barteleme's study would be to note that the subjects used were not psychotic or brain damaged for which the S-H is most atuned to identify (Shipley, 1941). Despite the mixture of statistical results, the majority of research suggests that the S-H,

through the discriminative notions of abstraction and concreteness, can be a significant indicator of emotional impairment.

The credibility underlying the validity and reliability of the MMPI tends to be mixed (Welch, 1956; Carson, publication date unknown). Nevertheless, the popular use of the instrument suggests that it has found favorable acceptance in the hands of the clinician. The constructs around which the MMPI was built were defined by a number of carefully chosen statements, each contributing some aspect of the identified construct. These statements were then categorized into clusters representing ten clinical scales and four validity scales. It was then concluded from research data that various "T" score responses would be indicative of certain psychological symptoms defined by the constructs of the test (Hathaway and McKinley, 1967). From such scale scores, then, it would be possible to suggest certain personality characteristics attributable to the subject taking the test. Also certain combinations of scores representative of various personality traits could be identified and suggest symptomatic characteristics of the individual (Hathaway and McKinley, 1967). With this in mind Leverenz (Welch, 1956) in an evaluation of the usefulness of the MMPI in the psychiatric service of a station hospital, concluded that the test was of definite value in neuropsychiatric service. He was able, he said, to discover unsuspected abnormal personality changes. Though the clinical results were not always substantiated by the scores obtained, the clinician was most always made aware of the fact that one or more abnormal changes in personality existed which required evaluation. Leverenz believed from the



results of his study that the inventory was able to assist the clinician in arriving at an earlier and more accurate impression of the patient.

In a study carried out by Modlin (Welch, 1956), the MMPI was evaluated by administering the test to 416 United States Army enlisted personnel. The results indicated that the MMPI was a valuable psychometric addition to clinical psychiatric work.

Hathaway and McKinley (1967) concur with these studies. In research to validate the MMPI, a high score on the test was found to predict positively the corresponding final clinical diagnosis or estimate in more than 60% of new psychiatric admissions. Even in cases where high scores were not completely accurate, there was always an indication that the trait being measured was to some degree abnormal.

Hock (1969) in Germany further concluded from the experience gained with 1500 administrations of the MMPI that the test was a suitable tool for personality diagnosis.

From this research as well as from other unquoted experimentation, it is suggested that the MMPI can be an adequate indicator of emotional impairment.

The notions underlying intelligence scales and personality inventories tend to be very different. Nevertheless, research has been done using the two types of instruments. Though the results have been somewhat mixed, the MMPI has been found to work compatibly with varied intelligence scales (Haywood, 1967; Clark, 1950; Steiner, 1963). Levitt and Rice (1968) concerned

with "sex and verbal proficiency on the simulation of normalcy procedure," tested 142 patients with the MMPI and the vocabulary part of the S-H. Sixty-eight of the patients who had three or more clinical scales on the MMPI of 70 or more were asked to retake the personality inventory and to simulate normalcy. The results positively related the S-H scores with the ability to change the MMPI profile whereas other variables were unable to be related. Thus, Levitt's research suggests compatability between the MMPI and the S-H intelligence scale.

Another study in this area was carried out by Haywood (1967). The positive difference between the verbal and the performance IQ on the Wechsler Adult Intelligence Scale (WAIS) as related to schizophrenia, and as identified by the MMPI, was the specific area of investigation. The subjects were comprised of fulltime freshman students of a four-year college. The subjects were given both the WAIS and the MMPI and a sample group was drawn from 533 freshman students; i. e., those subjects chosen were male students with T scores on the Sc scale of the MMPI of 60 or above. Thus, the experimental group was comprised of 23 subjects. A control group of 28 students was chosen at random from the same population. The mean IQ scores of the Sc group were Verbal IQ: 105.39, Performance IQ: 100.52, Full scale IQ: 103.57. The difference between the verbal and the performance IQs was significant at the .05 level. The mean IQ scores for the control group was Verbal IQ: 109.25, Performance IQ: 107.86, Full scale IQ: 109. The difference between the verbal scores, between the two groups, was not significant.



However, the difference between the performance scores was significant at the .05 level. Haywood concluded that "the results did not controvert the thought that persons with schizoid characteristics differed from the general population in intellectual functioning."

In another study combining the MMPI with an intelligence scale, the California Test of Mental Maturity (CTMM), Clark (1950) asked the question: does language-nonlanguage variability on the CTMM suggest maladjustment? In finding the answer, he selected 397 individuals who, through a guidance center, had been administered the MMPI and the CTMM. The sample groups consisted of a language plus group made up of 72 subjects whose language IQ scores were 20 or more points higher than their non-language IQ scores; a non-language plus group made up of 74 subjects whose non-language IQ scores were 21 or more points higher than their language IQ scores; a middle group of 136 subjects whose language scores ranged from 10 points lower to 9 points higher than their nonlanguage scores. The mean IQs for the language plus group was 120.35. The mean for the non-language plus group was 115.25. The results showed that the language plus group had higher scores on the majority of MMPI scales than did the other two groups. The language plus group was consistently higher on the Hs, Hy, Mf, and the Pa scales of the MMPI. Further, the language plus group included more individuals who scored 70 or more on one or more of the clinical subscales. The percentage of those having one or more subscales with a score of 70 or over proved to be: language plus: 50%; nonlanguage plus: 12%; middle group: 18%. Clark

concluded that though none of these results confirm neurotism in the language plus group, it did suggest that those with a 20 plus spread over the non-language subscale of the CTMM should be given a personality test for confirmation. Thus, this study as well as Haywood's study suggests that there is some compatibility between the MMPI and intelligence scales.

In a dissertation carried out in New York, Steiner (1963) investigated pictorial and conceptual thinking as related to personality using the MMPI and the WAIS. His study was concerned with the relationship between pictorial and conceptual thinking and certain types of personality variables; i. e., impulsivity and non-impulsivity. A sample of 114 males was drawn from a population of prison inmates with IQs ranging between 80 and 120. The subtests employed from the WAIS for pictorial thinking were picture arrangement and picture completion. Also, the picture absurdities subject three of the Revised Beta was used. Conceptual thinking was determined by the similarities and vocabulary subtests of the WAIS and the analogies subject of the Modified Alpha. The personality function was measured by the MMPI, specific scales were not stated. The results indicated a positive relationship between high cognitive functioning and non-impulsivity and between low cognitive functioning and impulsivity. The research suggests a compatible working relationship between the two testing instruments.

Another study using the MMPI and the WAIS was fashioned by Krippner (1964). Fifty college males were administered the two tests and the M-F score on each instrument was computed for the group. A WAIS M-F score was

computed by summing the weighted scores on the Information, Arithmetic, and Picture Completion, considered the M scale by Wechsler, and subtracting the sum of the vocabulary similarities, and digit symbol weighted scores or F scale. This arithmetic figure was considered the WAIS M-F score. Low, but significant positive correlations were found between the MMPI and WAIS M-F scores. The nature of the study was to divide the subjects into "disturbed" and "non-disturbed" groups on the basis of high MMPI clinical scores. "Disturbed" subjects were identified by possessing a significantly higher MMPI M-F mean score. In addition, there was a significant positive correlation between the height or "femininity" of the MMPI M-F score and the number of high clinical scores on the MMPI. However, there were no significant results obtained when WAIS M-F scores were related to emotional disturbance. It was concluded that, for this sample of males, "interest femininity" and "intellectual femininity" were related. However, "interest femininity" was more closely associated with the occurrence and degree of emotional disturbance.

The above studies were not reviewed to suggest that intelligence scales can be identified as significant indicators of intellectual impairment, but rather to show that the MMPI has been found to have a compatible working relationship with intelligence scales of which a portion of the S-H is. However, the nature of this study is not concerned with the intelligence quotient of the S-H alone, but how it interacts with the abstract scale of that test forming the conceptual quotient.

### Test Standardization

The S-H was standardized on 1046 individuals. The normative group was comprised of students ranging in continuous graduation from the fourth grammar grade through college. From this group mental-age equivalents were established for vocabulary scores and abstraction scores, and for the two combined. Reliability coefficients were obtained from the administration of the test to 322 army recruits. Coefficients were: vocabulary .87; abstraction .89; and for the two combined .92. No actual validity coefficients are available (Shipley, 1940). However, research since the standardization substantiates the validity of the vocabulary, abstraction, and conceptual quotient scales (Garfield and Fey, 1948; Lewinsohn, 1963; Fleming, 1943; Pollack, 1942; Halstead, 1943; and Wright, 1946).

The MMPI was first standardized on 724 individuals. The normative group was comprised of normal men and women and selected adult patients in the clinics and wards of the University of Minnesota Hospital (Dahlstrom, et al., 1970). Rosen, in a test-retest stability of the MMPI scales for a psychiatric population, found the test to produce a product-moment correlation for all scales ranging between .55 to .88 with .31 or larger reaching significance (Rosen, 1953). The validity of the scale is somewhat unique in that each test has its own validity check. In this sense, the validity pertains to the appropriateness or the acceptability of any one administration of the test. This is brought about through four subscales designed to monitor the

legitimacy of the test. They are the cannot say scale, the L scale, the F scale and the K scale. Validity may be checked then through the scoring and analysis of these scales.

The problem of this study is, then, that there is a lack of research to indicate whether the S-H conceptual quotient is a significant indicator of intellectual impairment as compared to MMPI test scores.

## PURPOSE

The nature of this research is to determine if there is any common predictable variance between the Shipley-Hartford test of Mental Maturity and the Minnesota Multiphasic Personality Inventory.

### Objective

It is the objective of this research to discover if a score on the CQ of the S-H can predict how many of Peterson's Psychotic Profile Signs a subject will acquire by taking the MMPI.

### Hypothesis

It would be remembered in the review of literature that no direct study has been made to ascertain the relationship between the S-H and the MMPI. Therefore, there is no reason to support a directional hypothesis. Thus, the following hypothesis is stated in the null form.

1. A subject's CQ score taken from his S-H test cannot predict the number of Peterson's Psychotic Profile Signs a subject might acquire by taking the MMPI.

2. A subject's CQ score taken from his S-H test cannot predict the T score the subject will acquire on any of the 10 subscales of the MMPI.

## PROCEDURES

### Population

The population from which the sample group was drawn were patients of the Wyoming State Hospital. Part of the experimental group was selected from hospital files, i.e., male patients who had resided at the hospital and who had been administered the S-H and MMPI tests as part of standard hospital admittance procedures. The other part of the experimental group was made up of male patients who were living at the hospital at the time of the experiment. The total group was comprised of 68 male patients who had a mental age of 14:3 (100 IQ) on the S-H intelligence scale, Shipley's minimum criteria for valid records of the S-H CQ scale, and who were between the ages of 18 and 45, the chronological span showing the least amount of CQ deterioration due to age (Garfield and Fey, 1948). All subjects were given the S-H and the MMPI. The conceptual quotient from the S-H was computed and correlated with the total number of Peterson's Psychotic Profile Signs and each subscale of the MMPI.

### Experimental Design

Because of the strict criteria used in selecting the subjects, i.e., males between the ages of 18 and 45 with an IQ of approximately 100, the available subjects at the hospital became limited. Therefore, all possible



subjects in the hospital who fit the criteria were tested. For additional data, past patient records meeting the criteria were drawn from the hospital files and added to the experiment. For this reason subject randomization was not possible. Thus differential selection could be a threat to internal validity.

Further, because some subjects did not have the patience to finish the MMPI, there could be possible maturation threats as well as the experimental threat of mortality caused by uncompleted MMPI's or invalid MMPI's. Because of this mortality and fatigue, only 52 subjects produced useful data. The effect of history on the study was controlled by administering both tests one after the other, controlling for any intervening events between the beginning and end of the experiment. Note: This same procedure was followed in the standard hospital admittance testing. The effects of testing and statistical regression were controlled for by administering both tests only once to each subject. And because of the nature of this type of study and the tests used, instrumentation was not a threat to validity.

Approximately half of the 68 subjects used in the experiment were living as patients in the hospital and were tested in groups of about fifteen allowing each subject to complete the two tests at his own speed. It may be noted that the S-H has time limits; however, it is a power test rather than a speed test. The other half of the experimental group, whose data was taken from the files was administered the two tests in groups of one to about ten as part of the standard hospital admittance procedures. These subjects were also allowed to finish at will. Because of the two types of testing situations,



i. e., one part of the experimental group being tested as part of hospital admittance and one part of the group being tested for reevaluation, there might be some threat to external validity. However, all subjects were encouraged to do their best at all times and standard procedures for administration of these tests was followed by hospital staff and this experimenter. Further, all possible steps to control external validity other than in those situations mentioned above were done.

#### Peterson's Psychotic Profile Signs

Peterson's Psychotic Profile Signs were chosen as the criteria for discriminating MMPI profiles because of its relative ease of use and successful experimental value (Peterson, 1954). The premise around which Peterson's profile signs were built was the clear need to establish a system which could more accurately diagnose or predict behaviors typically labeled as psychotic. Peterson states:

One way to refine a scheme of psychiatric classification then would be to examine patients who, when certain developments in the course of their illness had been considered, turned out to be incorrectly diagnosed. Thus careful study of behavior recorded at the time of diagnosis should permit more definite limitation of the class boundaries and more accurate placement of other patients for whom a diagnosis would be required. (Peterson, 1954)

From this reasoning, Peterson studied a group of veterans who should have been diagnosed "latent", "incipient" or "subclinical" schizophrenics but who were for some unknown reason classified otherwise. Three groups were

used. Group one was made up of a set of 33 false negative, male, white patients who had been examined by a psychologist and seen for at least two interviews by staff members at a VA mental hygiene clinic. They had also received some diagnosis which contained no suggestion of the word schizophrenic and who were later sent to a psychiatric hospital and were there said to be schizophrenic. Group two was comprised of 33 true negative, white, male nonhospitalized patients from the same clinic. These subjects were matched with the false negative subjects from group one; i.e., the primary diagnosis of group two was identical with that given his counterpart in group one.

Group three was made up of 27 white male patients who had received psychological and psychiatric examinations at the same clinic and who were diagnosed as either "latent", "incipient", "subclinical" schizophrenia, or "schizophrenia in remission" or who were later sent to the clinic and diagnosed some form of schizophrenia. The data was gathered with regard to age, education, Wechsler-Bellevue IQ and the MMPI profile. The false negatives, group one, was compared to the two control groups using chi square analysis to test the differences in education and the discriminatory effectiveness of the six signs Meehl (Meehl, 1946) said were most commonly used in differentiating MMPI psychotic profiles from neurotic ones. The signs are:

<u>Sign</u>	<u>MMPI Indicator</u>
Elevation	Four or more clinical scales > 70
F level	$F \geq 65$
Psychotic Triad	6, 8, or 9 > 1, 2, and 3

Neurotic Triad	2 > 1 and 3
8 versus 7	8 > 7
Elevation of 6 and 9	6 or 9 > 70

The results showed no significant differences in age, education or intelligence in the comparison of Group 1 to Group 2 and Group 1 to Group 3. Pattern analysis yielded the most definite results suggesting that group one was very much unlike the sample of true negatives even though as a group they had received the same diagnosis. Further, all six signs yielded a chi square significant at or beyond the .05 level. Peterson concluded that:

By assigning to all cases one point for the presence of each sign, it is possible to derive a total "psychotic" score for any patient. When this was done, and a cutting score for class designation placed between one and two, it was found that 88% of the incorrectly diagnosed patients in group one would have been accurately placed. This increase, however, would have been gained at the expense of incorrect diagnosis for 39% of the cases in group two. A cutting score between two and three would have led to correct designation for 67% of the members of group one, and incorrect diagnosis for 18% of the group two cases. The over-all percentage of accurate classification would have been 74% for both cutting points. (Peterson, 1954)

Though these results are not ideal, they do provide a far better attempt to classify than by subjective diagnosis. Because this study suggests that the diagnosis of subclinical schizophrenia is missed more often than it is made correctly, Peterson's psychotic profile signs were used in this research so that there might be a more objective way of identifying any emotional impairment.

## ANALYSIS

Analysis of the experimental data was achieved statistically by use of Pearson's product-moment correlation. The subjects' CQ scores, taken from the S-H, were correlated with the Psychotic Profile Sign scores as well as each subscale score on the MMPI. It is proposed that if a significant correlation occurred with any correlation, a regression equation would be devised to predict the probability of one score from the knowledge of the other. That is, a knowledge of a subject's CQ score on the S-H could indicate the probable number of Peterson Psychotic Profile signs contained in his MMPI profile. Further, a knowledge of a subject's CQ score could likewise indicate the probable T score on a particular subscale of the MMPI. A standard error of estimate could be calculated to measure the accuracy of the estimate given.

From this particular statistical analysis, then, several conclusions are possible. Correlation will allow investigation of any possible relationship between a S-H CQ score, a Psychotic Profile Sign score and the "T" score on any of the ten subscales. Such a relationship will lead to the degree of generality one can then make between the two tests. Further, the knowledge of a S-H CQ score can then predict, with a standard error of estimate, the number of psychotic signs a subject will have on an MMPI profile and/or the possible "T" score on an MMPI subscale, thus suggesting the degree of deterioration a subject may be suffering. This can then lead to the S-H as a predictor of deterioration, or a lack of it, in a manner representative of the MMPI.

## RESULTS

Using a Person product-moment correlation with degrees of freedom equal to 50 and the level of significance for it being tested for a one and two tailed test, the CQ score of the S-H showed no significant correlation with the Peterson Psychotic Profile Sign score  $\underline{r} = 0.1627$ . Significant correlation was found to exist between the CQ score and two subscales of the MMPI. These were the Hy subscale with an  $\underline{r}$  of 0.2736 significant at the .05 level one tailed test and the Mf subscale with an  $\underline{r}$  of 0.3632 significant at the .05 level two tailed test and the .05 and .01 levels of a one tailed test. Other correlations between CQ and MMPI subscales were not significant. See Table 1A.

Table 1. A: Correlation scores of CQ score to subscales of the MMPI.  
B: Correlation of CQ score to Peterson Psychotic Profile Sign score.

A		B
CQ: Hs	$r = -0.0223$	
CQ: D	$r = 0.1347$	CQ: PPS
CQ: Hy	$r = 0.2736$ sig. .05	
CQ: Pd	$r = 0.2229$	$\underline{r} = 0.1627$
CQ: Mf	$r = 0.3632$ sig. .05	not sig.
CQ: Pa	$r = -0.1682$	
CQ: Pt	$r = -0.0970$	
CQ: Sc	$r = 0.0261$	
CQ: Ma	$r = -0.1768$	
CQ: Si	$r = -0.0589$	

The correlation of the CQ score and the Hy subscale score accounts for approximately 7% of the existing variance between the two scales. Thus 93% is still unknown. Likewise the correlation of the CQ score and the Mf subscale accounts for 12% of the existing variance with 82% of the variance unaccounted for. Over all, no significant relationship exists between the S-H CQ score and any "T" score of the MMPI except where mentioned above. No significant relationship exists between a subject's S-H CQ score and the number of Peterson's Psychotic Profile Signs he may acquire on the MMPI. No accurate degree of generality can be made between the S-H and the MMPI. A knowledge of a S-H CQ score will not allow an accurate prediction of the number of Peterson Psychotic Profile Signs a subject may obtain on the same test. Further, the S-H CQ cannot be a predictor of deterioration or a lack of it, in a manner representative of the MMPI.

## DISCUSSION

Statistics resulted in acceptance of the first null hypothesis. There was no indication of any significant correlation between the S-H CQ and the number of Peterson Psychotic Profile signs. The resulting conclusion would be that though the S-H CQ has proven to be an effective indicator of emotional deterioration along with the MMPI, both tests are doing so in significantly different ways, inasmuch as no significant correlation can be measured.

It would be remembered that Peterson's Psychotic Profile Signs were used in this research to more objectively identify those subscales or combination of subscales which would lead to a diagnosis of emotional impairment. From the statistical research it was learned that the Psychotic Profile Signs significantly correlated with all but one of the subscales (Table 2). Such high correlation helps support the use of this scale within this research.

Table 2. Correlation of Peterson's Psychotic Profile Signs to the ten subscales of the MMPI

	Correlation	Sig.	Degree of discrimination
PPPS:Hs	r = 0.4445	sig. .01	two tailed test
PPPS:D	r = 0.5194	sig. .001	two tailed test
PPPS:Hy	r = 0.2268	not sig.	
PPPS:Pd	r = 0.4503	sig. .01	two tailed test
PPPS:Mf	r = 0.4421	sig. .01	two tailed test
PPPS:Pa	r = 0.5776	sig. .01	two tailed test
PPPS:Pt	r = 0.6328	sig. .001	two tailed test
PPPS:Sc	r = 0.7561	sig. .001	two tailed test
PPPS:Ma	r = 0.3258	sig. .05	two tailed test
PPPS:Si	r = 0.6571	sig. .001	two tailed test



The second null hypothesis was rejected because of statistical  $r$ 's between the CQ and the Hy and Mf subscales of the MMPI. Though the correlation was low, CQ to Hy had an  $r$  of 0.2736 sig. at the .05 level, one tailed test. CQ to Mf had an  $r$  of 0.3632 sig. at the .01 level one tailed test and .05 level two tailed test. Though these subscales showed significant correlation with the CQ score, they were found to be inadequate scales in adequately diagnosing emotional deterioration; namely, psychosis (Carson, 1967). The statistical relationship existing between these two subscales and the CQ scale is not understood by this experimenter completely. The Hy subscale, a scale developed to aid in the identification of patients using the neurotic defenses of the conversion form of hysteria, is part of the neurotic triad and psychosomatic "V" configurations associated with various MMPI profiles. Inasmuch as this research indicates a minimum but significant relationship between S-H CQ and the Hy subscales, it must be suggested that as yet, an undetermined construct is being measured by both the CQ and the Hy subscale. Similarly a further correlation exists between the Mf subscale and the CQ score. At present no literature supports this finding and possible justification would be conjecture at present (Dahlstrom and Welsh, 1960). Despite these findings there is little, if any support to suggest that the S-H CQ is of any real value in predicting Peterson's Profile signs as they relate to the MMPI or in reliably correlating with MMPI subscales in a helpful manner other than those subscales mentioned above.



## CONCLUSIONS

Both the S-H and the MMPI have been used widely and successfully in many areas of the therapeutic setting. It was noted that a significant correlation could exist between the two instruments which might facilitate in the economy of administration time and therapeutic diagnosis. From this basis the notion arose to experimentally compare the two tests. It must be concluded from this research that no significant relationship exists between these two instruments which would support the idea that one might be substituted for the other in reaching a therapeutic conclusion. Despite these results, it can be assumed that some degree of relationship exists between the two subscales Hy and Mf and the CQ of the S-H. To what extent this relationship could prove helpful is unknown. Further, this study has shown a strong support for the notion that Peterson's Psychotic Profile Signs can be a helpful criteria for discriminating MMPI profiles.

The necessary limitations which arose during the duration of this study somewhat limit the degree to which a generalization might be made. Because of the strict criteria used in the selection of a sample group it is necessary to look with caution to what this research is saying. It would be suggested that a larger number of subjects be used, including females, in extended research into this area. With a larger population which would facilitate randomization and the possible expanding of age limits and intelligence quotients, new

information might appear. Further, it might be profitable to extend the experimental population beyond the hospital setting. This might include out-patient clinics as well as community health centers.

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## VITA

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